

REMARKS

Claims 1-3 and 5-20 remain pending after amendment.

Claim Amendments

By this amendment, claim 4 is cancelled and the limitations thereof inserted into independent claim 1. Further, claim 1 is amended to incorporate the water-soluble solvent limitation previously recited in claim 2. No new matter is added by this amendment.

Applicants' Claimed Invention

Applicants' claimed invention is directed to an aqueous ink composition comprising water, a water-soluble solvent, a water-soluble resin, a dye, and a quick-drying property imparting agent, wherein the dye, if soluble in said water-soluble solvent, has a solubility in water lower than a solubility in the water-soluble solvent, said solubility of the dye in water being 10 wt% or lower, and the quick-drying property imparting agent has a solubility in water lower than a solubility in said water-soluble solvent.

It is applicants' intent to provide an aqueous ink composition which exhibits drying properties similar to those

exhibited by ethanol-based ink compositions but which do not include water as a solvent. Further, the ink composition of the present invention exhibits highly desirable drying properties in comparison to prior art compositions.

Applicants' invention is neither disclosed nor suggested by the prior art.

Rejection of Claims 1-3, 5-12, 16 and 19-20 under 35 USC 102(e)

Claims 1-3, 5-12, 16 and 19-20 stand rejected under 35 USC 102(e) as being anticipated by Ohta et al U.S. Patent No. 6,211,265. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

Ohta is directed to a water-based ink composition comprised of water, water-soluble polymers, water-soluble organic solvents, and dyes. The patent is silent with respect to the solubility characteristics of the dyes.

Ohta teaches the use of a water-soluble cationic polymer having affinity to colorants that is used to improve waterfastness. The patent is directed to quick drying properties may be attained by use of penetration accelerators (see column 8, lines 58-61).

By contrast, the present invention employs the difference in the solubility of the quick-drying property imparting agent in water and the water-soluble solvent to attain quick drying properties, not only for papers but also for impermeable printing materials such as plastic films. Such a technical concept is neither disclosed nor taught by the reference.

Applicants exemplify as the quick-drying imparting agent benzotriazole, which is also mentioned in the cited reference (column 7, line 45). The reference uses benzotriazole as a dissolution accelerator which easily dissolves inks even after being dried so as to prevent the inks from being dried at the tip of a nozzle. Thus, the present invention is clearly distinct from that of the reference with respect to the intended purpose of benzotriazole.

Further, the reference at column 5, lines 55-58 states that "the water-soluble organic solvent refers to a medium capable of dissolving the solute and is selected from organic, water-soluble solvents having a lower vapor pressure than water." (emphasis added). This is in direct contrast to applicants' claimed invention as now defined by amended claim 1 which requires the boiling point of the water-soluble solvent to be less than that of water, or alternatively, the vapor pressure of

the solvent to be greater than that of water. Applicants have found that the use of a water-soluble solvent having such properties enables the drying properties of the ink composition to be enhanced.

In view of the above, the reference cannot be said to anticipate the claimed invention.

The rejection is thus without basis and should be withdrawn.

Rejection of Claims 17-18 under 35 USC 103(a)

Claims 17-18 stand rejected under 35 USC 103(a) as being unpatentable over Ohta in view of Doi et al U.S. Patent No. 6,378,999 or Yatake et al U.S. Patent No. 6,051,057. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The Ohta reference is discussed at length above. Ohta discloses at column 2, lines 16-34 that a colorant having a specific structure is used in combination with a highly reactive water-soluble cationic polymer having a primary amino group to attain good lightfastness and waterfastness. However, as discussed above, the reference does not disclose or suggest that water, a water-soluble solvent as now defined by claim 1, a

water-soluble resin, a dye having low solubility in water (10 wt.% or lower), and a quick drying-property imparting agent having solubility in water lower than a solubility in the water-soluble solvent are used to attain an excellent drying property as claimed. Further, the reference neither discloses nor suggests the use of a fluorescent dye.

Neither Doi nor Yatake cure the deficiencies of Ohta.

Doi teaches at column 4, lines 22-23 that the coloring material is not particularly restricted. However, Examples 1-17 employ pigments such as carbon black as the coloring material. Thus, the reference is substantially directed to a pigment ink. The reference merely mentions dyes as the coloring material but does not teach that the dye has a solubility in water lower than a solubility in a water-soluble solvent to attain good drying properties as in applicants' invention. As described at column 2, lines 3-38, the object of the reference is to attain good dispersion stability and printing quality. Thus, the advantage of the present invention - good drying property - is not obvious from the teachings of the reference.

Yatake discloses at column 2, lines 20-25 an ink comprising a water-soluble colorant, a water-soluble organic solvent, water and a specific compound. As the water-soluble solvent, alcohols

are mentioned at column 6, lines 18-21. However, the reference does not teach that the dye has a solubility in water lower than a solubility in the water-soluble solvent to attain good drying properties as in the claimed invention.

Given the noted deficiencies of the cited references, the combined teachings of the references fail to result in the claimed invention.

The rejection is thus improper and should be withdrawn.

Rejection of Claims 1-16 and 19-20 under 35 USC 103(a)

Claims 1-16 and 19-20 stand rejected under 35 USC 103(a) as being unpatentable over JP 53-140105 in view of Kitamura et al U.S. Patent No. 6,498,222. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

JP '105 discloses an aqueous ink composition comprising water, a hydrophilic solvent, a water-insoluble binder, and europium-thenoyltrifluoroacetone chelate as a fluorescent substance. In both the JP '105 reference and the claimed invention, the europium complex is used together with a colorant, solvent and water. However, the JP reference is silent with respect to quick-drying properties, and in

particular, does not disclose nor suggest that a quick-drying property imparting agent such as benzotriazole is added to shorten the fixing time.

Moreover, the JP reference uses a high-boiling point hydrophilic organic solvent such as ethylene glycol monoethyl ether. This is in contrast to the present invention which requires the use of a water-soluble solvent having either a boiling point lower than that of water, or a vapor pressure higher than that of water in order to enhance drying properties of the ink composition.

Kitamura does not cure the deficiencies of JP '105.

The reference teaches that a cationic polymer having an affinity to a colorant is used to improve waterfastness. The patent only contemplates good drying properties with respect to papers by use of a penetration accelerator as specified in claim 22.

As described above, the claimed invention utilizes the difference in the solubility of the quick-drying property imparting agent in water and the water-soluble solvent to attain quick-drying properties not only for paper but for impermeable printing materials such as plastic films. Such a concept is neither disclosed nor suggested by the reference.

It is noted that benzotriazole (one of applicants' quick-drying property imparting agents) is mentioned in the Kitamura reference. However, the reference uses benzotriazole as a clogging presenter, which prevents ink from drying on the front end of a nozzle (see column 10, lines 11-25). Thus, the claimed invention is clearly distinct from that of Kitamura.

Kitamura further teaches at claim 22 that a solvent having a lower vapor pressure than water is preferably used. This is also in direct contrast to applicants' invention, which instead requires the use of a water-soluble solvent having either a boiling point lower than that of water, or a vapor pressure higher than that of water in order to enhance drying properties of the ink composition.

In view of the above, the rejection is without basis and should be withdrawn.

Rejection of Claims 17-18 under 35 USC 103(a)

Claims 17-18 stand rejected under 35 USC 103(a) as being unpatentable over JP '105 in view of Ohta, Doi U.S. Patent No. 6,378,999 or Yatake et al U.S. Patent No. 6,051,057. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The deficiencies of JP '105 are discussed above. The additionally-cited Ohta, Doi and Yatake references do not cure the deficiencies of JP '105.

As noted previously, Ohta discloses at column 2, lines 16-34 that a colorant having a specific structure is used in combination with a highly reactive water-soluble cationic polymer having a primary amino group to attain good lightfastness and waterfastness. However, as discussed above, the reference does not disclose or suggest that water, a water-soluble solvent as defined by claim 1, a water-soluble resin, a dye having low solubility in water (10 wt.% or lower), and a quick drying-property imparting agent having solubility in water lower than a solubility in the water-soluble solvent are used to attain an excellent drying property as claimed. Further, the reference neither discloses nor suggests the use of a fluorescent dye.

Doi teaches at column 4, lines 22-23 that the coloring material is not particularly restricted. However, Examples 1-17 employ pigments such as carbon black as the coloring material. Thus, the reference is substantially directed to a pigment ink. The reference merely mentions dyes as the coloring material but does not teach that the dye has a solubility in water lower than

a solubility in a water-soluble solvent to attain good drying properties as in applicants' invention. As described at column 2, lines 3-38, the object of the reference is to attain good dispersion stability and printing quality. Thus, the advantage of the present invention - good drying property - is not obvious from the teachings of the reference.

Yatake teaches at column 2, lines 20-25 an ink composition which includes a water-soluble colorant, a water-soluble organic solvent, and water. As the water-soluble solvent, alcohols are mentioned at column 6, lines 18-21. However, the reference does not teach that the dye has solubility in water lower than a solubility in the water-soluble solvent to attain good drying properties as in the claimed invention.

Given the noted deficiencies of the cited references, the combined teachings of the references do not result in the claimed invention.

The rejection is thus improper and should be withdrawn.

The application is now believed to be in condition for allowance and an early indication of same is earnestly solicited.

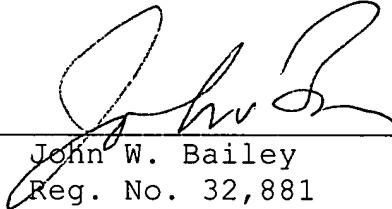
In the event that any outstanding matters remain in this application, Applicants request that the Examiner contact James W. Hellwege (Reg. No. 28,808) at (703) 205-8000 to discuss such matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By



John W. Bailey
Reg. No. 32,881

JWB/JWH

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000